

# TITLE: 7-IN-1 CARD READER FOR PCMCIA INTERFACE

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention is related to a 7-in-1 card reader for  
5 a PCMCIA interface, and especially to a PCMCIA-interface card-  
reader for connection an electric device (such as a notebook)  
provided with a PCMCIA interface and for proceeding to data  
reading, exchanging and transferring with memory cards of seven  
specifications or those of CF, MD, MMC, MS, SD, SM and XD memory  
10 cards.

### 2. Description of the Prior Art

Generally, an electric device such as a digital camera, a  
digital video camera and a PDA etc. mostly is built therein with  
an insertion slot of a specific specification for a memory card  
15 to allow drawing it out of and changing it for a flash memory  
card to increase its capability of storage of data; thereby,  
there have been memory cards of various specifications including  
CF cards (CompactFlash cards), MD cards (Micro Drive Cards), MMC  
cards (MultiMedia Cards), MS cards (Memory Stick Cards), SD  
20 cards (Secure Digital Cards), SM cards (Smart Media Cards) and  
XD cards (eXtreme Digital Cards) etc., and thereby when an  
electric device is to perform data reading, they similarly  
require a built-in insertion slot for a memory card of a  
corresponding specification to make connection of the memory  
25 cards with the electric device, and data reading, exchanging and

transferring can then be done.

And more, common electric devices carried on ones' person such as a notebook not only are continuously elevated in their functions, but also are designed aiming at the direction of lightening weight in order to meet the feature of being convenient for carrying and receiving. Taking a notebook as an example, the electric device itself, in addition to the necessary input/output ports provided on a peripheral device, basically is equipped at least with a set of PCMCIA interface to render the peripheral device coincident with the PCMCIA interface to make connection with the notebook through an insertion slot for a PCMCIA interface on the notebook.

Hence there have been card readers meeting PCMCIA interfaces in the markets provided to make connection of electric devices with memory cards; however, card readers meeting PCMCIA interfaces available presently mostly can only afford use of inserted memory cards with specific specifications, thereby, when an electric device provided with a PCMCIA interface is used in connection with a memory card purchased from a market, limitation of quite a degree still exists because of the non-coincidence between the specification of the memory card and the specification of a card reader.

#### SUMMARY OF THE INVENTION

The 7-in-1 card reader for a PCMCIA interface of the present invention takes a cartridge coincident with the insertion slot

of the PCMCIA interface as a main body; the cartridge is provided on the front side thereof with a first connector for the PCMCIA interface, and on the rear end thereof with a second and a third connector, it is provided therein with an electric connecting circuit to make circuit connection of the second and the third connectors with the first connector.

Wherein the second connector has a plurality of insertion slots for memory cards of the specifications including those of CF, MD, MMC, MS and SD memory cards on a side thereof other than the side connecting with the connecting circuit; the third connector has an insertion slot for memory cards of the specifications including those of SM and XD memory cards on a side thereof other than the side connecting with the connecting circuit; thereby a card reader for connecting an electric device and for proceeding to data reading, exchanging and transferring with memory cards of seven specifications or those of CF, MD, MMC, MS, SD, SM and XD memory cards through a PCMCIA interface is obtained.

The present invention will be apparent in its structural combination and the entire mode of operation thereof after reading the detailed description of the preferred embodiment thereof in reference to the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view showing the apparent structure of the card reader of the present invention;

Fig. 2 is an analytic perspective view showing the structure of the card reader of the present invention;

Fig. 3 is a perspective schematic view showing the states of inserting connection of the card reader of the present invention with an electric device such as a notebook and with  
5 memory cards.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The entire structure combination of the 7-in-1 card reader for a PCMCIA interface of the present invention is as shown in  
10 Figs. 1 and 2, it takes a cartridge 10 coincident with the insertion slot of a PCMCIA interface as a main body; the cartridge 10 is provided on the front side thereof with a first connector 21 for the PCMCIA interface, and on the rear end thereof with a second connector 22 and a third connector 23, it  
15 is provided therein with an electric connecting circuit 30 to make circuit connection of the second and the third connectors 22, 23 with the first connector 21.

Wherein the first connector 21 is fixed on the front side of the cartridge 10, and is connected with the connecting circuit  
20 30 by means of connecting pins 25, a coupling part 211 provided on a side of the first connector 21 other than the side connecting with the connecting circuit 30 forming inserting connection with the PCMCIA interface; the cartridge 10 has an upper cover 11 and a lower cover 12 to envelop a part of the main body of the  
25 connecting circuit 30 and a part of the main body of the first

connector 21 to expose the coupling part 211 of the first connector 21 at the front side of the cartridge 10.

Referring simultaneously to Figs. 2 and 3, the second connector 22 has three insertion slots 24 for memory cards of the specifications including those of CF, MD, MMC, MS and SD memory cards on a side thereof other than the side connecting with the connecting circuit 30; the third connector 23 has an insertion slot 24 for memory cards of the specifications including those of SM and XD memory cards on a side thereof other than the side connecting with the connecting circuit 30; and the connecting pins 25 are provided at the insertion slots 24 on the second and the third connectors 22, 23 to connect with the connecting circuit 30.

In the embodiment shown in Fig. 3, one of the insertion slots 24 on the second connector 22 is common for an SD memory card 43 and an MMC memory card (not shown); the insertion slot 24 is provided on the inner side thereof with a channel 241 with a width and a thickness in coincidence with those of the MMC memory card and the SD memory card 43 to prevent wrong insertion of a memory card. Similarly, another one of the insertion slots 24 on the second connector 22 is common for a CF memory card 41 and an MD memory card (not shown); the insertion slot 24 is also provided on the inner side thereof with a channel 241 with a width and a thickness in coincidence with those of the CF memory card 41 and the MD memory card to prevent wrong insertion of a memory

card.

Additionally, the cartridge 10 is provided on the rear part thereof with a cover 13 to envelop the main parts of the second and the third connectors 22, 23. The cover 13 is further provided  
5 with indicating lights 14 connecting respectively to the insertion slots 24 of the second and the third connectors 22, 23; the indicating lights 14 show the states of operation of the memory cards in the insertion slots 24.

When the entire card reader is in use, the cartridge 10 is  
10 inserted in a PCMCIA interface insertion slot 51 of an electric device 50 to connect with the electric device 50 via the PCMCIA interface of the first connector 21, and allows inserting therein and connecting thereto memory cards taken among those of seven specifications or those of a CF memory card 41, an MD  
15 memory card (which commonly uses a memory card insertion-slot with the CF memory card, so that only the CF memory card is depicted to show the state of inserting and connecting), an MS memory card 42, an SD memory card 43, an MMC memory card (which commonly uses a memory card insertion-slot with the SD memory  
20 card, so that only the SD memory card is depicted to show the state of inserting and connecting), an SM memory card 44 and an XD memory card 45 via the second and the third connectors 22, 23, thereby it allows further data reading, exchanging and transferring with the electric device 50, this can largely  
25 increase the convenience of use and applicability in connecting

and use of the electric device 50 having the PCMCIA interface with the memory cards sold in the markets.

Particularly, the second and the third connectors of the entire card reader are provided respectively with insertion slots for memory cards connecting with the electronic circuit of the electric device via connecting pins, thereby the electric device has four kinds of swappable hardware for data storage by the fact that the second connector has three insertion slots for memory cards and the third connector has one insertion slot for memory cards, they can be regarded as four connectors capable of operating independently simultaneously; and by control of the IC in the electronic circuit on the circuit operation of the insertion slot for memory cards, the electric device can execute data exchanging, reading and writing simultaneously on the memory cards inserted in the insertion slots, or execute data exchanging and storing among the memory cards inserted in the insertion slots for the memory cards.

The description and drawings are only for illustrating a preferred embodiment of the present invention, and not for giving any limitation to the scope of the present invention. It will be apparent to those skilled in this art that various modifications or changes without departing from the spirit, scope and characteristic of this invention shall also fall within the scope of the appended claims of the present invention.